INTERNET

Internet use and risk behaviours: an online survey of visitors to three gay websites in China

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Objectives: To describe the risk behaviours of visitors to gay websites and to explore the role of the internet in the HIV transmission among the Chinese men who have sex with men (MSM).
Methods: Between May and August 2006, visitors of three Chinese gay websites were invited to complete an online questionnaire about the use of the internet and risk sexual behaviours.
Results: The median age of the online sample was 25 years old (range 18 to 64). Over three-quarters (77.6%) had an education of college or higher. Less than 44% of the online sample reported little or no risk for HIV transmission. These men had either had no anal intercourse (28.0%) or had always used a condom for anal intercourse (15.8%). Although only about half of the participants reported that their main purpose of visiting the gay websites was to look for sexual partners, most participants (86.1%) had used the internet to seek partners. Compared with men seeking sexual partners only on the internet, men seeking partners both in traditional gay venues and on the internet were older, less likely to be students and more likely to have unprotected anal intercourse, more than six sexual partners in the past 6 months and commercial sex behaviours.
Conclusion: The users of the gay websites are relatively young and well educated, and highly vulnerable to HIV/AIDS, given their low prevalence of consistent condom use and multiple-risk sexual behaviours. Effective intervention programmes should be implemented and strengthened in China, especially for those who seek sexual partners both on the internet and in traditional gay venues.

The world wide web has become a widely used meeting place for facilitating sex networking among men who have sex with men (MSM) in developed countries.[1–3] Its anonymous nature and relatively confidential environment maintain men's privacy. The numerous users make men easily find other men for sexual and social contacts.[3] While the internet enhances sex-seeking efficiency, it may also place MSM at high risk for HIV/STI. The increasing number of studies conducted in developed countries have demonstrated that MSM who seek sexual partners on the internet are more likely to have unprotected anal intercourse (UAI) and more sexual partners and to have a history of STD.[4–7] However, no studies have been conducted in China—the largest developing country in the world—to explore sex-seeking behaviours and the use of the internet among this specific group.

China is facing an emerging HIV epidemic among MSM. Although limited data show that HIV prevalence among this group remains at a relatively low level—for example, it was 3.1% in Beijing,[8] 1.7% in Guangdong (Southern China) and 1.2% in Shenyang (northern China)[9]—high-risk behaviours such as UAI and multiple sexual partners and deficiency of HIV preventive knowledge place the Chinese MSM at high risk for HIV infection.[10–12] Evidence also demonstrates that Chinese gay men are avid users of the internet. In 2001, for instance, there were more than 250 Chinese websites dedicated to gays, lesbians and bisexual people (gay websites).[13] By the end of 2004, the number of people accessing broadband connections increased to 94 million.[14] In addition, it has been reported that there are approximately 10–20 million gay men in China, accounting for 2–4% of the adult male population.[15] The unique nature of the internet may attract more Chinese MSM to choose the internet to socialise and seek sex in addition to or instead of traditional gay venues, as homosexuals in China are still under huge cultural pressure from the society and family.[16] A number of questions associated with the gay websites in China need to be answered. Who are using the gay websites? What and why are they using the gay websites? Are the gay websites users vulnerable to HIV infection? Are those MSM who seek sexual partners on the internet at higher risk for HIV than those who seek sexual partners from traditional gay venues and in other ways? The purpose of this project was to explore the characteristics of Chinese gay websites users and their risk behaviours in the use of gay websites for sexual purposes, and then to provide evidence for developing possible HIV/AIDS surveillance and intervention strategies in the internet era.

Key messages

- At present, the internet MSM users in China may represent a young and well-educated group of MSM
- As a new meeting ground, the internet has become an emerging risk environment for HIV/AIDS transmission for the Chinese MSM population
- MSM who seek sex both on the internet and in traditional gay venues are at significantly higher risk for HIV infection than those seeking sex on the internet only or in other ways

METHODS

Subjects

Participants in this study were visitors of three gay websites: http://www.aixinsky.com, http://www.yntz.net and http://www.boysky.com. Aixinsky.com attracts more than 10 000 daily hits and has over 100 000 registered members.

Abbreviations: MSM, men who have sex with men; UAI, unprotected anal intercourse

Most of its visitors are gay men living in northern China. Yntz.com is popular with gay men in Southwest China with over 10 000 registered members. Boysky.com is a national gay website with approximately half million registered members, and most of them are from eastern China. These three websites provide similar services: daily news, forums, personal profiles and voice/video chat-rooms. Men who were 18 years old and over and had oral or anal sex with males in the past year regardless of their sexual orientation were invited to participate in the study. However, because a convenience sampling strategy (not a probability-sampling method) was used in this study, the target population probably was not the total population of online MSM users. The results from this research therefore would be considered indicative, and no attempt would be made to infer to the total population of Chinese online MSM users.

Study website and data collection

A study website was developed in the Hypertext Mark-up Language (HTML) appearing in Chinese. It mainly included three web pages: the welcome screen, the informed consent form and the online questionnaire. In order to reduce the requirement for computer equipments and shorten the time it took for participants to download and submit questionnaires, all web pages were presented in a consistent black print on a white background. Before the online survey, a pilot test was conducted to check the function, readability of the website. The study website supports different computer platforms/operating systems (Microsoft XP, Linux and Macintosh OS) and different web browsers (Internet explorer 6.0, Safari 1.2, Netscape 7.0 and Firefox 2.0). The study website was hosted on each of the three gay websites separately. The responses were hosted in the same server and stored in an encrypted Access dataset. Although the three gay websites are accessible to the general population, the web pages of the study website were not registered with any search engines. By doing this, it was hoped that participants were limited to subjects who visited the selected gay websites.

In May–August 2006, a series of banners, pop-ups and text notifications were posted on the web pages and chat-rooms of the three gay websites to advertise the research project. Eligible men visiting the three gay websites were invited to participate in the online survey. Clicking on a pop-up, a banner or the hyperlink on the text notification took potential participants to the study website. After reading the informed consent form, eligible respondents were invited to complete an online questionnaire. The completed questionnaire was submitted and transferred to a database to create a new record along with a survey number and submission date and time. Respondents were not required to provide an answer to each question before being allowed to answer any subsequent questions or before submitting the questionnaire. Because some subjects may be curious about the contents of the study and falsify characteristics that exclude them, no separate selection form was used. Although eligibility criteria for participation were mentioned in the informed consent form, all users could participate in the survey. In addition, in order to reduce repeat entries, respondents were strongly advised in the consent form and at the beginning of the questionnaire to participate only once. During the data-management process, respondents with the same date of birth, marriage status and living in the same city were identified as duplicate submits. Duplicate submits and ineligible subjects were eliminated in data analysis.[17]

Questionnaire

The questionnaire used for this study was mainly based on a paper survey conducted in Harbin and Beijing previously, which collected information on demographic characteristics, sexual behaviours with males and females, commercial sex, and use of illegal drugs, etc.[10] In addition, respondents were also asked the frequency, reasons for and place of accessing the internet as well as sex seeking on the internet and in traditional gay venues, which referenced the questions used in a study among gay men in Sydney and Melbourne.[3] The questionnaire had 12 primary questions, about 40 sub-set questions, and eight demographic items. Because shorter questions are better for reading on the screen, online survey questions and instructions were made briefer but still maintained the balance between brevity and a friendly tone. Coded questions used nominal scales, semantic differential scales, single- and multiple-choice selection options, and continuous questions. Several open-ended questions, such as ''Please report any other reasons you might have for seeking sexual partners on the internet'', were also included at the end of a coded question set. The questionnaire was reviewed by six key informants, three of whom were MSM, and the other three were from the local Centers for Disease Control and Prevention.

Data analysis

Descriptive epidemiological analyses were used to examine the demographic characteristics, risk behaviours and the use of gay websites of the surveyed population. A polytomous logistic regression with nominal response was performed to determine whether men seeking sex in different ways are at different risk for HIV infections. The dependent variable was different approaches of seeking sex partners, which was categorised into three groups: men seeking sexual partners both in traditional gay venues and on the internet, men seeking sex on the internet only (reference group) and men seeking sex in other ways (such as through telephone networks, personal social networks, etc). Independent variables were those that have shown their ability to predict HIV risk based on previous studies.[10 18] Age, education, marriage status, occupation and sexual orientation were among the demographic characteristics included in the data analysis.[19]

Stata 9.0 was used to conduct the analysis.

This study was approved by the University of Adelaide Human Research Ethics Committee and the ethics committee of the China National Centre for AIDS/STD Control and Prevention.

RESULTS

Demographic characteristics

In total, 2469 completed online questionnaires were submitted over the study period. Of 410 participants who were excluded in the final analysis, 210 (7.3%) reported having no male–male sex in the past 12 months, 53 (1.8%) were less than 18 years old, nine (0.3%) showed signs of intentional deception, and 138 (4.8%) provided incomplete questionnaires. No questionnaires were identified as duplicate submits according to the criteria mentioned before. The online sample covered all 31 Provinces in China. As shown in table 1, the study sample was largely 20–30 years old with a median age of 25 years (range 18 to 64). Over three-quarters (77.6%) had an education of college or higher. The majority (83.7%) were currently not married. Approximately 64% of the participants identified themselves as homosexual, and about 24.4% were bisexual.

Risk behaviours

Most respondents (84.4%) reported having had oral or anal sex with males in the past 6 months, of whom nearly 60% reported having multiple partners ($\geq$2) (table 1). For men who had insertive anal sex in the past 6 months, 26.0% reported never using a condom, and 29.5% reported always using a condom. For those who had receptive anal sex in the past 6 months,

Table 1 Characteristics of men who have sex with men recruited online in China, 2006

Characteristics*	N (%)
Age	
⩽20	310 (15.4)
21–30	1293 (64.3)
⩾31	408 (20.3)
Education	
Junior high school or less	78 (3.3)
Senior high school	455 (19.1)
College graduate	1846 (77.6)
Current student	614 (27.7)
Married	398 (16.3)
Self reported sexual orientation	
Homosexual	1500 (63.8)
Bisexual	574 (24.4)
Heterosexual	67 (2.9)
Undecided	211 (9.0)
Age at first sex (mean ± SD)	19.2 (4.4)
Having sex with a male at first sex	1999 (84.4)
Having sex with females in the past 6 months	383 (16.3)
No. of male sexual partners in the past 6 months	
0	415 (17.5)
1	583 (24.7)
2–5	955 (40.4)
⩾6	411 (17.4)
Condom use during insertive anal intercourse with men in the past 6 months	
Never	357 (26.0)
Sometimes	612 (44.5)
Always	406 (29.5)
Condom use during receptive anal intercourse with men in the past 6 months	
Never	364 (28.6)
Sometimes	529 (41.9)
Always	381 (29.9)
Condom use during anal intercourse including both incertive and receptive in the past 6 months	
Never	316 (14.0)
Sometimes	950 (42.2)
Always	357 (15.8)
No anal sex	631 (28.0)
Paying for sex in the past 6 months	191 (7.8)
Exchanging sex for money in the past 6 months	130 (5.8)
Illicit drug use	45 (1.9)
History of STD	599 (24.7)

*The number of respondents answering each question varied because of missing values.

28.6% reported never using a condom, and 29.9% reported always using a condom. In total, only 43.8% reported little or no risk for HIV infection: these men had either had no anal intercourse (28.0%) or had always used a condom for anal intercourse (15.8%). Over half of all respondents (56.2%) reported having had UAI in the past 6 months.

Only 1.9% (45/2,432) of the overall sample reported any illicit drug use (Table1). The prevalence of injecting drug use was extremely low (15/2,432). No signs indicated that participants from the Provinces such as Yunnan, Xinjiang, Hunan, Guangxi, Sichuan, where injecting drug use was relatively serious and was the main HIV transmission mode, had higher prevalence of illicit drug use than participants from other Provinces. In addition, 24.7% (599/2,424) reported having a history of STD infections, with 4.1% (99/2,424) reported having a history of syphilis infection and 7.3% (178/2,424) having a history of gonorrhoea.

Use of the gay websites

Sex-seeking behaviours on the internet and in traditional gay venues from this survey are presented in table 2. Nearly the entire online sample (97.7%) reported having ever visited a gay website before. The most common purpose to use the gay website (54.7%) was ''just looking'' and ''surfing'', and over half (51.6%) were looking for casual sex partners. About one-third reported they were using the gay website to look for general health information. Participants accessed gay websites from a variety of locations, but most commonly from their own homes (50.9%) and internet cafes (38.6%). Nearly half (45.2%) visited gay websites several times a week, and approximately a quarter (25.3%) did so at least once a day.

Although only approximately half of the participants reported that their main purpose in visiting gay websites was to look for sexual partners, the majority of them (86.1%) had sought sexual partners through the internet. Among them, the median number of sexual partners who met through the internet in the past 6 months was two (25th–75th percentiles, 1–5). The reasons most commonly highlighted for initially choosing the internet to seek sexual partners were that the internet seemed to be an easy and convenient way to cruise (61.1%) and that it was a good way to know more people (44.0%). Only approximately 15% reported that the internet was supposed to be a safe way to cruise. It is also interesting to note that approximately 39% of the men reported being tired of cruising in the traditional gay venues.

Cruising in traditional gay venues

Out of the internet sample, 47.5% also reported ever visiting traditional gay venues such as gay bars, bath houses, public toilets or parks and so on (table 2). Of these people, most (77.7%) visited such venues less than once a month, and 42.3% had ever sought sexual partners there. The median number of sexual partners who met in traditional gay venues was two (25th–75th percentiles, 0–4).

Table 2 Cruising on the internet and in traditional gay venues of MSM recruited online in China, 2006

Variables*	N (%)
Visiting gay websites before	2410 (97.7)
Purposes of using gay websites	
Just looking/surfing	1266 (54.7)
Meet men for casual sex	1194 (51.6)
Meet men for a possible stable relationship	1036 (44.7)
Looking for health information	787 (34.0)
Online sex (cyber-sex)	365 (15.8)
Meet with friends regularly	205 (8.9)
Other purposes	201 (8.7)
Accessing gay websites	
At home	1196 (50.9)
Internet café	907 (38.6)
At work	181 (7.7)
Others	66 (2.8)
Frequency of visiting gay websites	
Everyday	590 (25.3)
Several times a week	1055 (45.2)
Once a week	268 (11.5)
Less than once a week	421 (18.1)
Seeking sex on the internet ever	2063 (86.1)
Reasons for using gay websites to look for sexual partners	
An easy and convenient way to cruise	1261 (61.1)
Good way to know more people	908 (44.0)
Tired of traditional gay venues (bars, public bathhouses, etc)	799 (38.7)
Good and easy to find more sexual partners	520 (25.2)
A safe way to cruise	303 (14.7)
Friends were doing/talking about it	183 (8.9)
No. of sexual partners met through the internet in the past 6 months	
0	231 (13.3)
1	371 (21.4)
2–5	762 (43.9)
⩾6	370 (21.4)
Visiting traditional gay venues	1162 (47.5)
Frequency of visiting traditional gay venues	
More than once a week	141 (12.5)
Less than once a week	111 (9.8)
Less than once a month	877 (77.7)
Seeking sex in traditional gay venues	486 (42.3)
No. of sexual partners met in traditional gay venues in the past 6 months	
0	113 (26.7)
1	98 (23.1)
2–5	147 (34.7)
⩾6	66 (15.6)

*A total of 2469 subjects were studied. The number of respondents answering each question varied.

Association between sex seeking and risks for HIV

As shown in table 3, a polytomous logistic regression was performed to determine whether ways of seeking sexual partners were associated with HIV risk behaviours. Compared with men seeking partners on the internet only, men seeking sexual partners both in traditional gay venues and on the internet were older (mean age, 27.3 (SD 6.1) vs 25.5 (5.7)), less likely to be students (OR 0.53, CI 0.35 to 0.80), more likely to have more than six partners in the past 6 months (OR 3.37, CI 2.38 to 4.79) and to have commercial sex behaviours (including buying and selling sex). Consistently, compared with men seeking sex in other approaches, the group of seeking sex both online and offline was less likely to be students (OR 0.39, CI 0.23 to 0.66), more likely to be homosexual (OR 2.06, CI 1.31 to 3.24) and also more likely to have UAI (OR 2.96, CI 1.90 to 4.62), six or more sexual partners in the past 6 months (OR 10.4, CI 4.27 to 25.1), commercial sex behaviours and a history of STD (OR 3.19 CI 1.78 to 5.73). No significant age difference emerged between the two groups (mean age, 27.4 (6.1) vs 25.8 (5.7)). The group of men seeking partners in other ways was similar to the group of men seeking partners on the internet in terms of demographic characteristics except that they were less likely to be homosexual (OR 0.49, CI 0.35 to 0.69), but men seeking sex in other ways were less likely to have more than six sexual partners in the past 6 months (OR 0.33, CI 0.14 to 0.77) and less likely to have UAI (OR 0.47, CI 0.33 to 0.69) and a STD history (OR 0.40, CI 0.24 to 0.68).

DISCUSSION

These data suggest, first, that it is both possible and practical to conduct HIV/AIDS behavioural surveys in China through internet-based questionnaires. The internet has been widely used to facilitate inter-personal contacts in developed countries.[2 6 20] It should not be surprising that this convenient mechanism for finding sex quickly makes the internet a new meeting ground for gay men in China that did not exist in the 1990s. The wide use of the gay websites among the Chinese MSM population provides a good opportunity to obtain a large number of participants across geographical and cultural boundaries. In this study, within a period of less than 4 months, nearly 2500 participants from all of the 31 provinces in China provided completed questionnaires.

The MSM gay website users in China appear to represent a young and well-educated subpopulation with a certain number of students. Approximately 80% of the respondents are less than 30 years old, and more than 75% have a college education or higher. Our findings are consistent with the statistical results of the Chinese internet users conducted by the China internet Network Information Center in 2006, which found that 71.5% of Chinese internet users are less than 30 years old, and 52.8% of them have an education of college or higher.[21]

Table 3 Differences among MSM who sought sexual partners in different ways: nominal logistic regression

	Both on the internet and in traditional gay venues (n = 444)	On the internet only (n = 1564)	In other ways (n = 339)	Both on the internet and in traditional gay venues vs On the internet only			In other ways vs On the internet only			Both on the internet and in traditional gay venues vs In other ways		
Characteristics	N (%)	N (%)	n (%)	OR	p	95% CI	OR	p	95% CI	OR	p	95% CI
Age (≥31-year-old)	98 (27.7)	235 (18.3)	60 (21.5)	1.65	0.020	1.08, 2.52	1.25	0.475	0.72, 2.01	1.37	0.311	0.74, 2.53
Education (college)	316 (74.2)	1214 (80.1)	245 (75.4)	0.70	0.062	0.47, 1.01	0.87	0.514	0.57, 1.32	0.80	0.406	0.47, 1.35
Occupation (student)	64 (15.9)	419 (29.9)	116 (38.7)	0.53	0.002	0.35, 0.80	1.33	0.127	0.92, 1.92	0.39	0.001	0.23, 0.66
Marriage (married)	81 (18.4)	196 (12.6)	50 (15.1)	0.88	0.659	0.49, 1.58	1.06	0.847	0.56, 2.04	0.82	0.634	0.36, 1.84
Self-identified as homosexual	271 (65.3)	999 (63.4)	173 (53.9)	1.02	0.915	0.72, 1.44	0.49	0.000	0.35, 0.69	2.06	0.002	1.31, 3.24
Having sex with women	89 (20.7)	214 (14.3)	49 (15.4)	1.05	0.864	0.63, 1.75	0.72	0.281	0.39, 1.32	1.46	0.317	0.69, 3.08
≥6 male sexual partners in the past 6 months	186 (44.9)	201 (13.5)	12 (3.7)	3.37	0.000	2.38, 4.79	0.33	0.011	0.14, 0.77	10.4	0.000	4.27, 25.1
UAI	284 (69.4)	826 (57.6)	108 (35.8)	1.39	0.055	0.99, 1.94	0.47	0.000	0.33, 0.69	2.96	0.000	1.90, 4.62
Paying for sex ever	121 (27.4)	149 (9.6)	31 (9.1)	2.33	0.000	1.56, 3.49	0.82	0.591	0.42, 1.65	2.81	0.006	1.34, 5.90
Exchanging sex for money ever	93 (21.7)	136 (9.1)	14 (4.3)	2.73	0.000	1.79, 4.15	0.37	0.036	0.14, 0.94	7.46	0.000	7.77, 20.1
History of STD	164 (37.6)	377 (24.1)	31 (9.3)	1.29	0.130	0.93, 1.79	0.40	0.001	0.24, 0.68	3.19	0.000	1.78, 5.73

It is highly likely that young and well-educated MSM possess more computer literacy or have more ready access to personal computers than the older population in China.[22] This finding is consistent with the ''early adopter'' profile indicated by studies on new media adoptions in the USA, which indicate that adaptors of new technologies tend to be younger, upscale and better educated than non-adopters.[23] China is experiencing a rapid increase in the use of the internet with 137 million Chinese citizens regularly accessing the internet at least 1 h per week in 2006.[21] However, the penetration of the internet in China is low, and the internet development is still at its early stage. Internet technology is more prevalent in large metropolitan areas. Lack of computer skills, low income and low level of education are still barriers to internet access. We found that nearly 40% of the participants access the internet mainly in internet cafes, which is not heavily used in developed countries. This may reflect the fact that some young MSM in China cannot afford to have a computer and internet access at home. The use of internet cafes, which is very cheap (US$0.4 per hour), becomes a good choice for them.

These findings highly indicate that at present internet MSM users in China may represent a group of MSM who are different from those recruited in the traditional gay venues. The online sample is significantly younger and more educated than some community samples in China.[8 11 24 25] The current behavioural surveillance strategy among MSM in China, which utilises convenience sampling in traditional gay venues, is not reasonably representative and is affected by the selection bias. The internet may provide a good opportunity to gain access to those MSM who may not be able to be reached in a community setting.

The internet has become an emerging risk environment for HIV/AIDS transmission for the Chinese MSM population.[26] The main findings from this study indicate that the online MSM population is highly vulnerable to HIV/AIDS given their low prevalence of consistent condom use and multiple high-risk sexual behaviours. Over half of them had UAI in the past 6 months, and less than 16% consistently used a condom. Nearly 60% of them had multiple partners in the past 6 months. Seeking sex through the internet has become their main purpose to visit gay websites. The potential for instant interaction with many people in a relatively anonymous fashion enhances the use of the internet for sex-seeking purposes.[4] Effective intervention strategies targeted at increasing condom use and decreasing the number of sexual partners in this population are crucially needed. Studies have indicated that online MSM users showed favourable attitudes to online methods of promoting prevention of STI/HIV.[27] In this study, more than one-third of the respondents indicated that they were using the internet to look for health information. This may represent preventive and health intervention value from a public health perspective in an internet era.

Several studies conducted in Western countries have also indicated that men who sought sexual partners on the internet were more likely to have STD and to have unprotected anal intercourse,[28] and thus were at higher risk for HIV than those who did not.[4–7] A study conducted in Hong Kong also found that being an internet sex networker was associated with having contracted a sexually transmitted disease, having more than three sexual partners and having engaged in anal sex.[22] Our study shows a gradual decrease in the risk for HIV transmission from the group of seeking sex both on the internet and in gay venues, to the group of internet only and next to the group of seeking sex in other ways.

MSM gay website users who seek sexual partners both in gay venues and on the internet carry the highest risk for HIV transmission and acquisition compared with the other two groups. They are more likely to have UAI and to have multiple and commercial sexual behaviours. It is not difficult to understand this, considering cruising in gay venues and searching on the internet are the most common ways for Chinese MSM to seek sexual partners.[16] Thus, those included in these groups are likely to be at the higher end of the spectrum of risk behaviour and to have a high turnover of partners. This study showed nearly half of the online participants visited traditional gay venues, and about 40% of them seek sexual partners there, although 38% of the men reported being tired of cruising there. It indicates that traditional gay venues continually play an important role in the sex-seeking process in China. Gay venues first emerged in the late 1990s in major cities of China, and then gradually found their way to other cities.[16] These venues provide a platform for MSM to communicate and socialise, and also may enhance the transmission of HIV/AIDS. In recent years, free condoms, AIDS-awareness posters and even safe-sex-themed dance/drama performances have been used as tools by owners of gay bars or bath houses to educate patrons about health education and prevention of HIV/AIDS.[16]

It is assumed that MSM living in Southwestern China (Yunnan, Guangxi, Sichuan, Xinjiang) where drug use is one of

the primary reasons for the increasing number of people infected by HIV/AIDS, might be at higher risk for HIV through drug injection than MSM in other regions.[29 30] This study, however, indicates that the prevalence of injecting drug use is very low among the MSM population across the country, and no regional difference has been detected. The low prevalence of injecting drug use indicates that currently male–male sex transmission may be still the main mode of HIV transmission among the online Chinese MSM population.

This online study was the first major survey exploring risk behaviours and use of the internet for sex-seeking purpose among the Chinese MSM population. The sample reported here is obviously biased in that it is a convenience sample of gay website users.[17] Although China is experiencing a rapid growth rate in the number of internet users, MSM living in rural areas or lacking basic computer skills would not be in this sample. Selection bias resulting from a convenience cross-sectional design may limit the generalizability of the research findings. The results of this study therefore can be considered indicative and cannot be generalised to the population of all online MSM users. Data validity and quality is another pervasive challenge for almost all internet-based surveys. It is very difficult to verify participants' identity and intention to participate and the validity of their responses. With few social and interviewers' constraints, a high rate of missing values emerged in this study. However, the perceived safe and anonymous nature of the internet may help to illicit more information on sensitive questions. Our study showed that some respondents provided very detailed and self-disclosing information to several open-ended questions.

CONCLUSION

Currently, gay website users in China are young and well educated, and many of them never visit or seek sexual partners in traditional gay venues. This provides a unique opportunity to conduct online HIV/AIDS behavioural surveillance, internet-based prevention and intervention to those who cannot be contacted in the traditional gay community. As a new emerging meeting place for the Chinese MSM population, the internet has clearly become a risk environment for HIV transmission. Those who seek sexual partners both in gay venues and on the internet are at the highest end of the spectrum of risk behaviours. Effective and targeted prevention measurements should be developed to minimise the HIV transmission risk in the internet era.

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CONTRIBUTORS

DZ developed the original protocol and drafted this manuscript. PB and JH contributed to the study design and the write-up. FL provided important financial support and contributed to data collection. HT and JZ contributed to the study design and data collection.

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